

Empedocles, et al.  
Application No.: 09/784,645  
Page 12

PATENT

APPENDIX B  
PENDING CLAIMS

1. (Twice amended) An analytical method, comprising:
  - (a) providing a first plurality of antiligands immobilized on a solid support at positionally distinct and spatially encoded locations thereon to provide a first array, wherein the plurality of antiligands comprises a first antiligand capable of binding specifically to a first ligand;
  - (b) contacting the array with a sample containing or suspected of containing the first ligand, wherein the first ligand is linked through a linker to a first semiconductor nanocrystal before, during or after the contacting, under conditions in which the first ligand, if present, binds specifically to the first antiligand to form a first complex;
  - (c) optionally, removing unbound ligand from the array; and
  - (d) identifying the location of the first complex by detecting and, optionally, quantifying the presence in the first complex of the first semiconductor nanocrystal, whereby detection of the first semiconductor nanocrystal and the location at which it binds indicates the presence and the identity of the first ligand.
2. The method of claim 1, wherein the linker comprises two members of a binding pair, a first member attached to the first ligand and a second member attached to the first semiconductor nanocrystal.
3. (Twice amended) The method of claim 1, wherein the sample contains a second ligand linked to a second semiconductor nanocrystal which is optionally detectably distinct from the first semiconductor nanocrystal, wherein the second ligand is capable of binding specifically to a second immobilized antiligand to form a second complex; and identifying comprises determining which location or locations of the array include the first complex, the second complex or the first and second complexes by detecting and, optionally, quantifying simultaneously or sequentially the presence in the first and second

Empedocles, et al.  
Application No.: 09/784,645  
Page 13

PATENT

complexes of the first and second semiconductor nanocrystals, whereby the location or locations at which the first and second semiconductor nanocrystals bind indicates the identity of the first and second ligand, and the first and second ligands are optionally distinguished according to a signal that is distinct for each of the first and second semiconductor nanocrystals.

4. The method of claim 1, wherein the antiligands are nucleic acid probes and the first ligand is a target nucleic acid.

5. The method of claim 3, wherein the antiligands are nucleic acid probes and the first and second ligands are target nucleic acids.

6. The method of claim 4, wherein the first ligand is linked to the first semiconductor nanocrystal prior to the contacting step.

7. The method of claim 5, wherein the first and second ligands are linked to the first and second semiconductor nanocrystals prior to the contacting step.

8. (Once amended) The method of claim 6, wherein the first ligand is linked to a single first semiconductor nanocrystal.

9. (Once amended) The method of claim 7, wherein the first ligand and the second ligand are linked to a single first and a single second semiconductor nanocrystal, respectively.

10. The method of claim 4, wherein the linker comprises two members of a binding pair, a first member coupled to the target nucleic acid and the second member coupled to the semiconductor nanocrystal.

11-12. Canceled.

13. The method of claim 4, wherein the nucleic acid probes are allele-specific nucleic acid probes.

Empedocles, et al.  
Application No.: 09/784,645  
Page 14

PATENT

14-15. Canceled.

16. The method of claim 1, wherein the plurality of antiligands are proteins.

17. The method of claim 16, wherein the ligand is a protein.

18. The method of claim 16, wherein the antiligands are antibodies.

19. (Twice amended) The method of claim 16, wherein the sample contains a second ligand linked to a second semiconductor nanocrystal that is capable of binding specifically to a second immobilized antiligand to form a second complex and optionally detectably distinct from the first semiconductor nanocrystal; and

identifying comprises determining which location or locations of the array include the first complex, the second complex or the first and second complexes by detecting and, optionally, quantifying simultaneously or sequentially the presence in the first and second complexes of the first and second semiconductor nanocrystals, whereby the location or locations at which the first and second semiconductor nanocrystals bind indicates the identity of the first and second ligand, and binding of the first and second ligands is optionally distinguished according to a signal that is distinct for each of the first and second semiconductor nanocrystals.

20. The method of claim 1, wherein the antiligand is a component of a tissue specimen.

21. (Twice amended) The method of claim 20, wherein the sample contains a second ligand linked to a second semiconductor nanocrystal that is capable of binding specifically to a second immobilized antiligand to form a second complex and optionally detectably distinct from the first semiconductor nanocrystal; and

identifying comprises determining which location or locations of the array include the first complex, the second complex or the first and second complexes by detecting and, optionally, quantifying simultaneously or sequentially the presence in the first and second complexes of the first and second semiconductor nanocrystals, whereby the location or locations

Empedocles, et al.  
Application No.: 09/784,645  
Page 15

PATENT

at which the first and second semiconductor nanocrystals bind indicates the identity of the first and second ligand, and binding of the first and second ligands is optionally distinguished according to a signal that is distinct for each of the first and second semiconductor nanocrystals.

22. The method of claim 20, wherein the antiligands are selected from the group consisting of proteins, nucleic acid targets, oligosaccharides and combinations thereof, and the ligands are independently selected from the group consisting of antibodies, nucleic acid probes, lectins, aptamers and combinations thereof.

23. The method of claim 22, wherein the antiligands are distinct target nucleic acids and the ligands are nucleic acid probes.

24. The method of claim 22, wherein the antiligands are proteins and the ligands are proteins.

25-26. Canceled.

27-39. Non-elected.

40. (Twice amended) An analytical method, comprising:

(a) providing a first plurality of antiligands immobilized on a solid support at positionally distinct and spatially encoded locations thereon to provide an array, wherein the plurality comprises a first antiligand that is a binding partner of a first ligand;

(b) contacting the first array with a sample containing or suspected of containing the first ligand, whereby the first ligand, if present, and the first antiligand interact to form a first complex;

(c) labeling the first ligand in the first complex with a first semiconductor nanocrystal; and

(d) identifying which location of the array includes the first complex by detecting the presence therein of the first semiconductor nanocrystal, whereby detection of the

Empedocles, et al.  
Application No.: 09/784,645  
Page 16

PATENT

first semiconductor nanocrystal and the location at which it binds indicates the presence and the identity of the first ligand.

41. (Twice amended) The method of claim 40, wherein:
- the first plurality of antiligands comprises a second antiligand that is a binding partner of a second ligand;
- the sample contains or is suspected of containing the second ligand, whereby the second ligand, if present, and the second antiligand interact to form a second complex;
- step (c) comprises labeling the second ligand in the second complex with a second semiconductor nanocrystal that is optionally detectably distinct from the first semiconductor nanocrystal; and
- step (d) comprises determining which location or locations of the array include the first complex, the second complex or both the first and second complexes by detecting the presence therein of the first and second semiconductor nanocrystals, whereby the location or locations at which the first and second semiconductor nanocrystals bind indicates the identity of the first and second ligand, and binding of the first and second ligands is optionally distinguished according to a signal that is distinct for each of the first and second semiconductor nanocrystals.

42. (Once amended) The method of claim 40, wherein the first ligand comprises a first member of a first binding pair and the semiconductor nanocrystal is linked to a second member of the first binding pair through a linker.

43. The method of claim 41, wherein the second ligand comprises a first member of a second binding pair and the second semiconductor nanocrystal is linked to a second member of the second binding pair.